Sustainable Building Design Using the Sustainable Project Rating Tool (SPiRiT)

US Army Corps of Engineers

Engineer Research & Development Center

Construction Engineering Research Laboratory

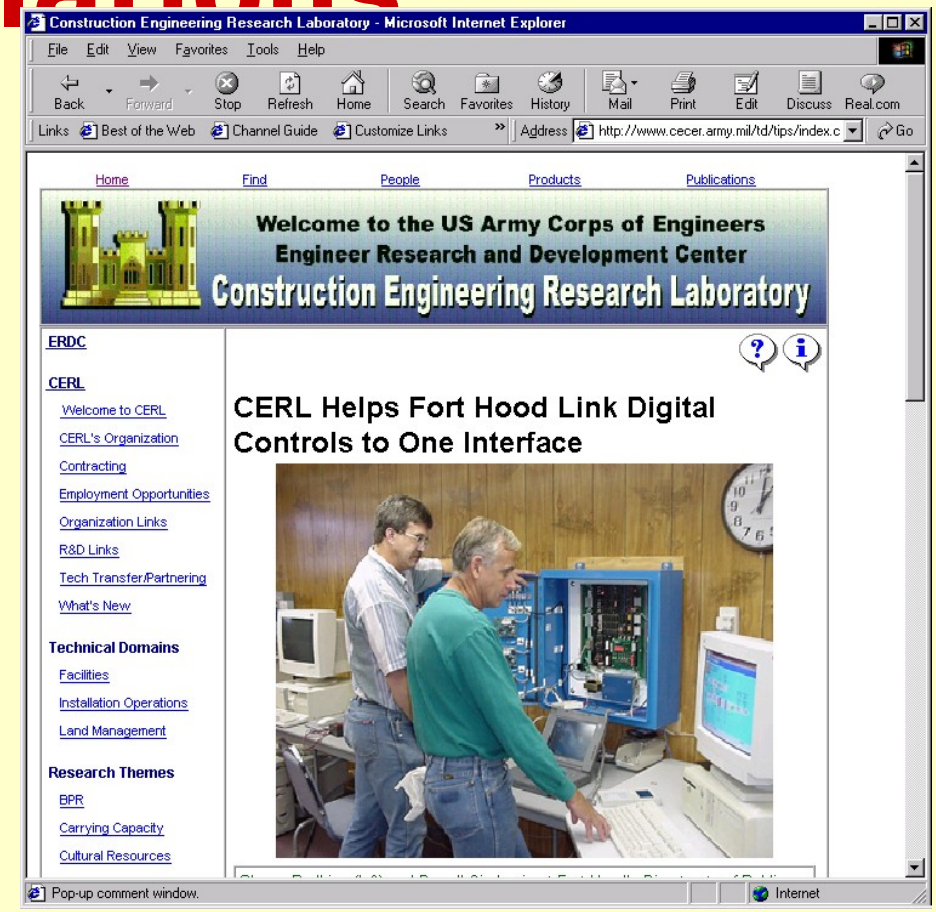
CERL: Technology Infusion for Sustainable Installations

How Do I Find Information?

- ***Search on the website for***
- ***Technical Domains***
- ***Research Themes***
- ***People***
- ***Products or***
- ***Publications***

http://www.cecer.army.mil

1-800-USA-CERL



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Army Sustainable Projects

- Army Sustainable Infrastructure
  - Policy
  - Accomplishments
  - Future Directions
- SPiRiT
  - Overview
  - LEED Comparison

  (Scoring, Format, Ratin
- Research

"The world we have created today as a result of our thinking thus far has problems that cannot be solved by thinking the way we thought when we created them." - *Albert Einstein*

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Why Sustainable Design for DoD?

- Improves quality of life for all --
  - Health, safety, and productivity
- Champion for environmental/energy stewardship.
- More life cycle cost effective
- Required by Executive Orders, DoD and USACE.

Executive Orders

- EO 13101, Greening The Government Through Waste Prevention, Recycling, and Federal Acquisition, September, 1998.
- EO 13123, Greening The Government Through Efficient Energy Management, June, 1999.

Army Sustainable Infrastructure Policy

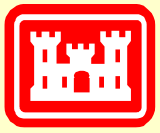
DEPARTMENT OF THE ARMY

Engineering Technical Letter (ETL) 1110-3-491

1 May 2001

Engineering and Design

SUSTAINABLE DESIGN FOR MILITARY FACILITIES



Http://www.cecer.army.mil/SustDesign/SPiRiT

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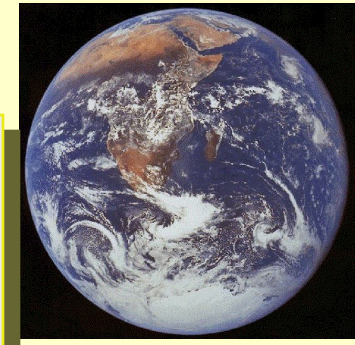
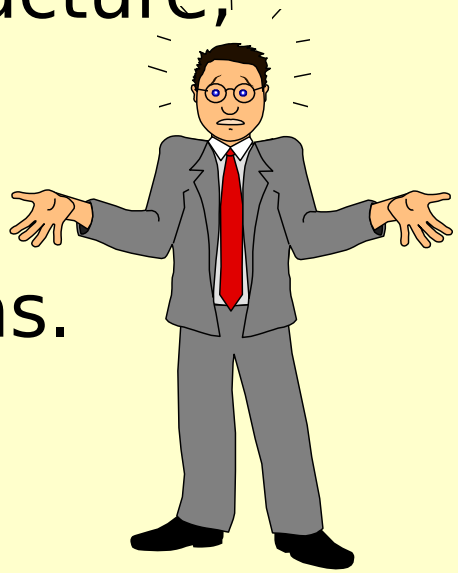


ETL 1110-3-491 “. . . the design, construction, operation and reuse/removal of the built environment (infrastructure as well as buildings) in an environmentally and energy efficient manner. . . meeting the needs of today without compromising the ability of future generations to meet their needs.”

d design principles and practices to create a built environment which optimizes functionality and operability of the total system…

What Does That Mean In The Army?

- Environmentally friendly and energy efficient facilities and infrastructure;
- Holistic process;
- Meets current missions; and
- Accommodates future missions.



Army Advocacy for Sustainable Design

- Sustainable Installation Facilities & Infrastructure:
  - Adaptive to the local environment
  - Lessen demand on natural resources
  - Serve the needs of current and future generations
  - Consume less energy
  - Incorporate recycled products
  - Are easily maintained; and
  - Are friendly to the surrounding neighborhood and ecosystem

Corps Initiatives

- ETL 1110-3-491;
- A/E selection policy and guidance;
- Sustainable Project Rating Tool (SPiRiT);
- 110 guidance documents revised;
- Sustainable design and development training;
- ERDC Tech Report - Planning, Engineering, and Design of Sustainable Facilities and Infrastructure - An Assessment of the State of Practice (Mar ‘01);
- Web site for sustainable design resources; and
- Army membership in USGBC.

SPiRiT – Sustainable Project Rating Tool

- Water Efficiency:
- Sustainable Sites:
- Energy & Atmosphere:
- Materials & Resources:
- Indoor Environmental Quality:
- Facility Delivery Process:
- Current Mission:
- Future Mission:

Background

- SPiRiT is now required for the rating of projects throughout the Army;
- SPiRiT is based on LEED 2.0 Green Building Rating System™ and used by legal agreement between the Corps and USGBC;
- SPiRiT was developed to meet Army installation requirements not addressed by the commercial based LEED 2.0; and
- While predominantly LEED based, SPiRiT incorporates the “best of the best” concepts from many similar rating systems.

http://www.cecer.army.mil/SustDesign/SPiRiT

SPiRiT Format and Use

- System is made up of prerequisites and credits.
- Format is:
  - Intent
  - Requirement
  - Technologies/Strategies
- Each requirement has one or more points.
- Format is typical and other rating systems are using it also (LEED, Triangle Region HPG, NYC HPBG)

SPiRiT Scoring

- Sustainable Sites: 20
- Water Efficiency: 5
- Energy and Atmosphere: 28
- Materials and Resources: 13
- Indoor Environmental Quality: 17

Green Results

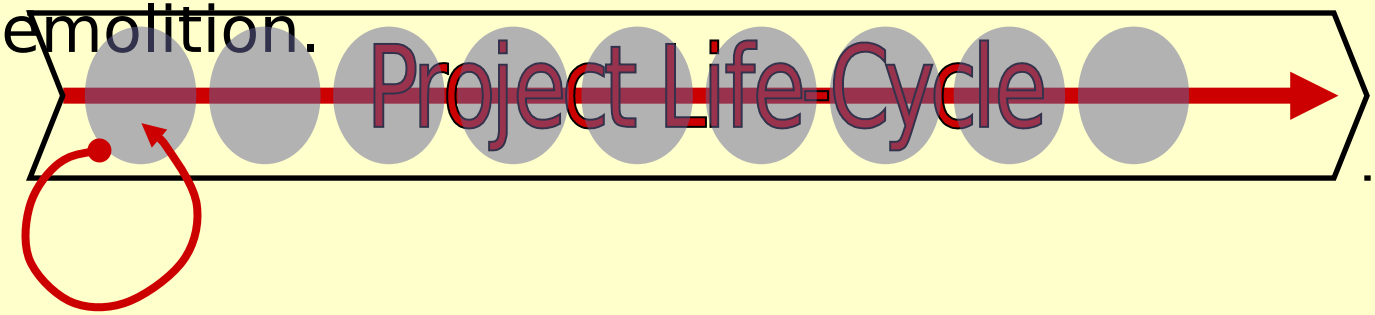
- Facility Delivery Process: 7
- Current Mission: 6
- Future Mission: 4

TOTAL 100

Life-Cycle Synergy

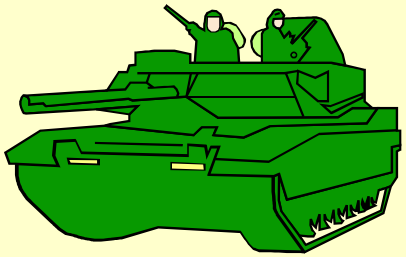
Holistic Design Process

- Integrated project team facilities delivery approach;
- Process starts in the planning stage and involves all stakeholders; and
- Complete facilities life cycle including planning, programming, designing, construction, operation, maintenance and demolition.



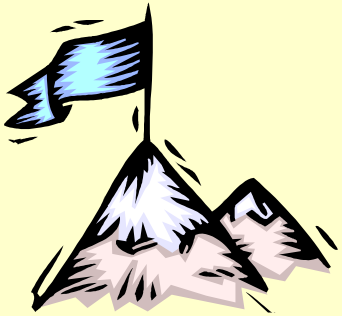
Meet Current Missions

- Are easily/economically operated and maintained; and
- Provide pleasant environments for the soldier and civilian workforce



Accommodate Future Missions

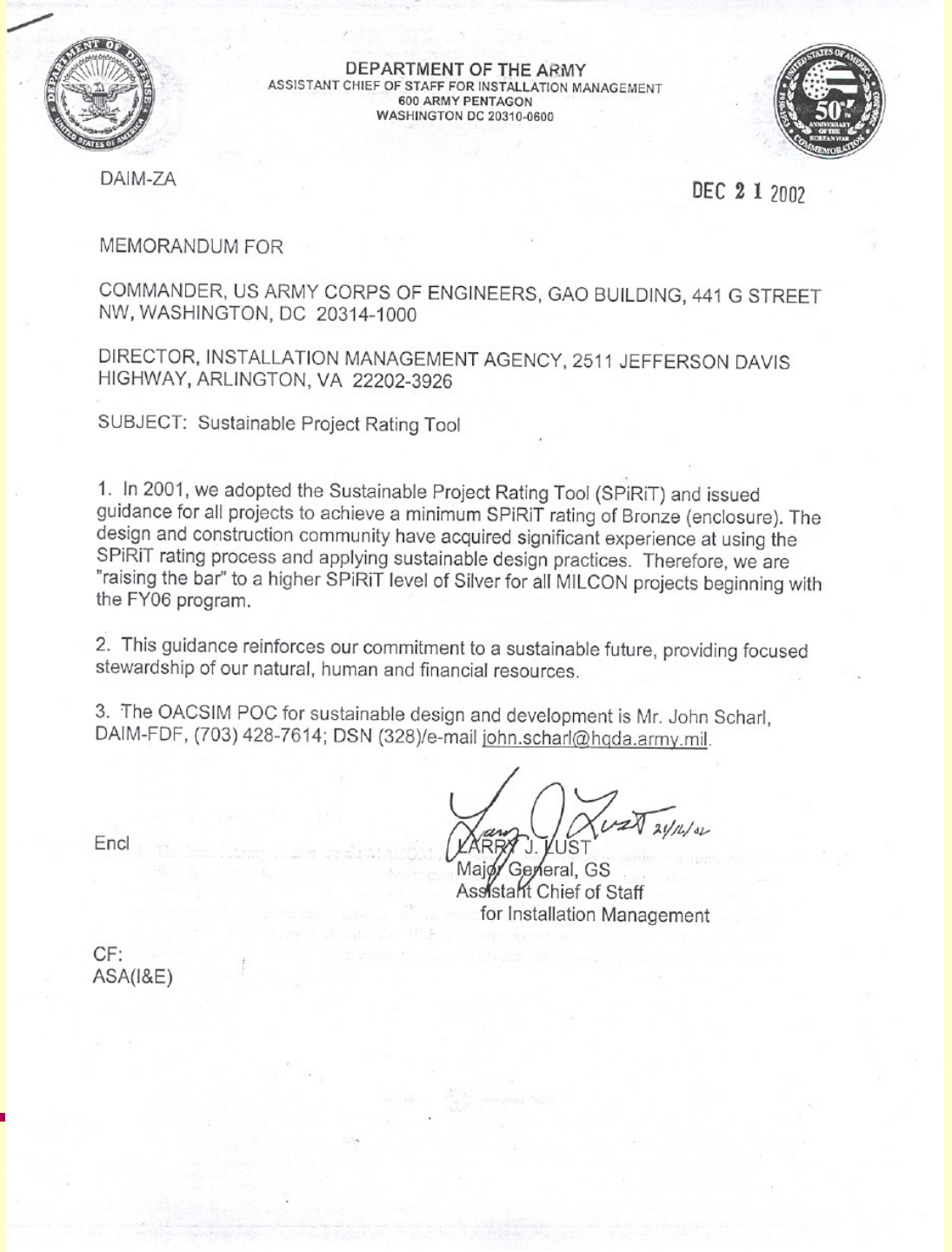
- Facility and supporting facilities' life span projected for future adaptations; and
- Facility and supporting facilities' designed to accommodate alternative future functions



SPiRiT Rating

- **Points: 100 Possible.**
- **Score at least the following number to obtain the indicated rating:**
  - **75-100: Platinum**
  - **50-74: Gold**
  - **35-49: Silver**
  - **25-34: Bronze**
- **Bronze to be minimum expected score.**
- **Starting in FY06 Silver required.**

SPiRiT Silver starting in FY06



DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON DC 20310-0600

DAIM-ZA

DEC 2 1 2002

MEMORANDUM FOR

COMMANDER, US ARMY CORPS OF ENGINEERS, GAO BUILDING, 441 G STREET NW, WASHINGTON, DC 20314-1000

DIRECTOR, INSTALLATION MANAGEMENT AGENCY, 2511 JEFFERSON DAVIS HIGHWAY, ARLINGTON, VA 22202-3926

SUBJECT: Sustainable Project Rating Tool

1. In 2001, we adopted the Sustainable Project Rating Tool (SPiRiT) and issued guidance for all projects to achieve a minimum SPiRiT rating of Bronze (enclosure). The design and construction community have acquired significant experience at using the SPiRiT rating process and applying sustainable design practices. Therefore, we are "raising the bar" to a higher SPiRiT level of Silver for all MILCON projects beginning with the FY06 program.

2. This guidance reinforces our commitment to a sustainable future, providing focused stewardship of our natural, human and financial resources.

3. The OACSIM POC for sustainable design and development is Mr. John Scharl, DAIM-FDF, (703) 428-7614; DSN (328)/e-mail john.scharl@hqda.army.mil.

Encl

LARRY J. LUST
Major General, GS
Assistant Chief of Staff
for Installation Management

CF:
ASA(I&E)

US Army Corps of Engineers

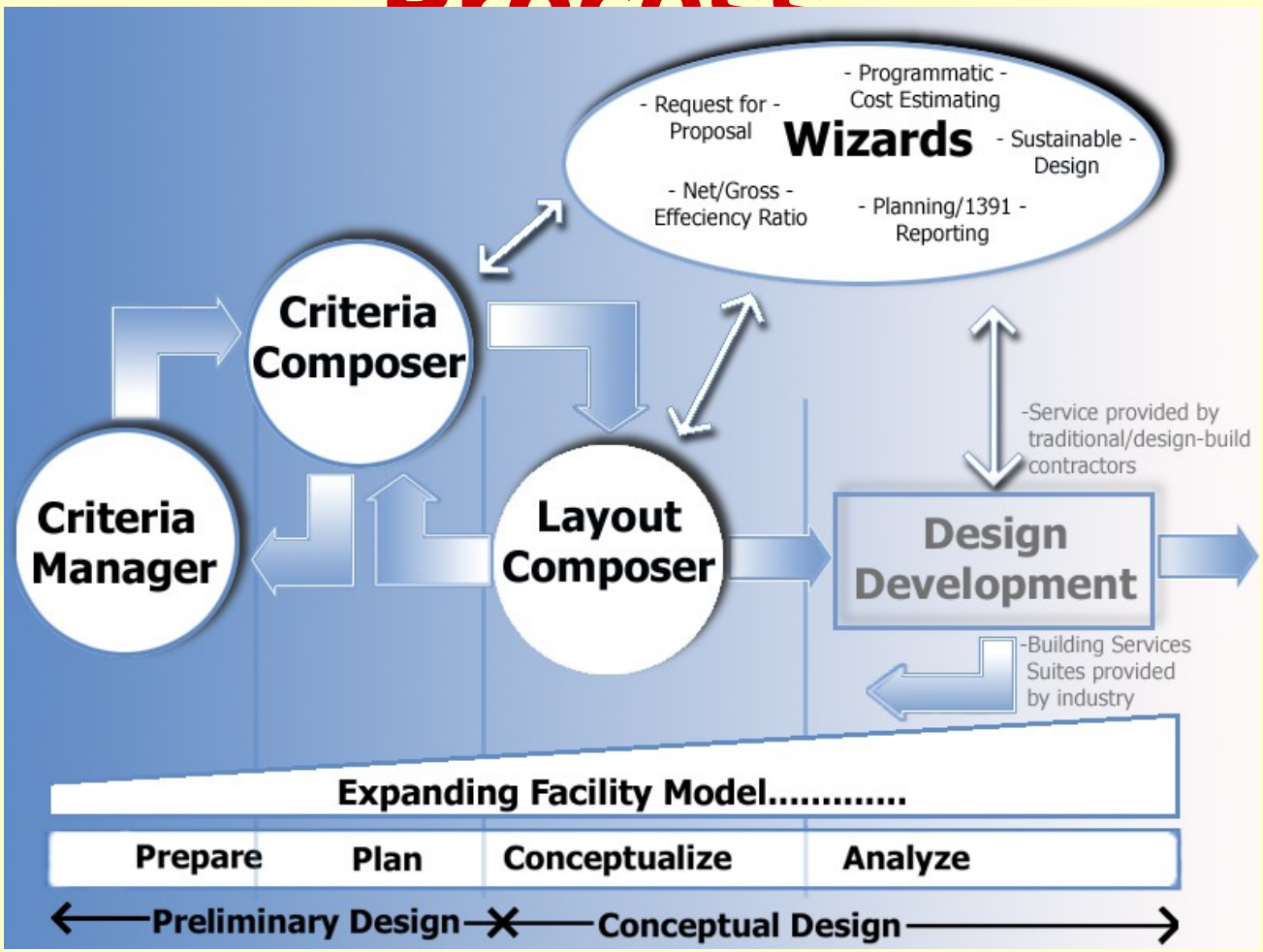
How is SPiRiT Being Used?

- Project teams hold charrettes to create 1391 (scope and cost estimate to request project funding).
- Once project is approved for design, project teams* hold SPiRiT goal-setting & design charrettes (*need member with SDD experience!)
- Teams document SPiRiT related decisions during design (design analysis).
- Teams use DrChecks to review design.
- Project teams self rate during two scoring charrettes to determine final SPiRiT score (final design & after construction).
- If team doesn't meet SPiRiT bronze, must notify HQ.

Vision of Future Sustainable Design Process

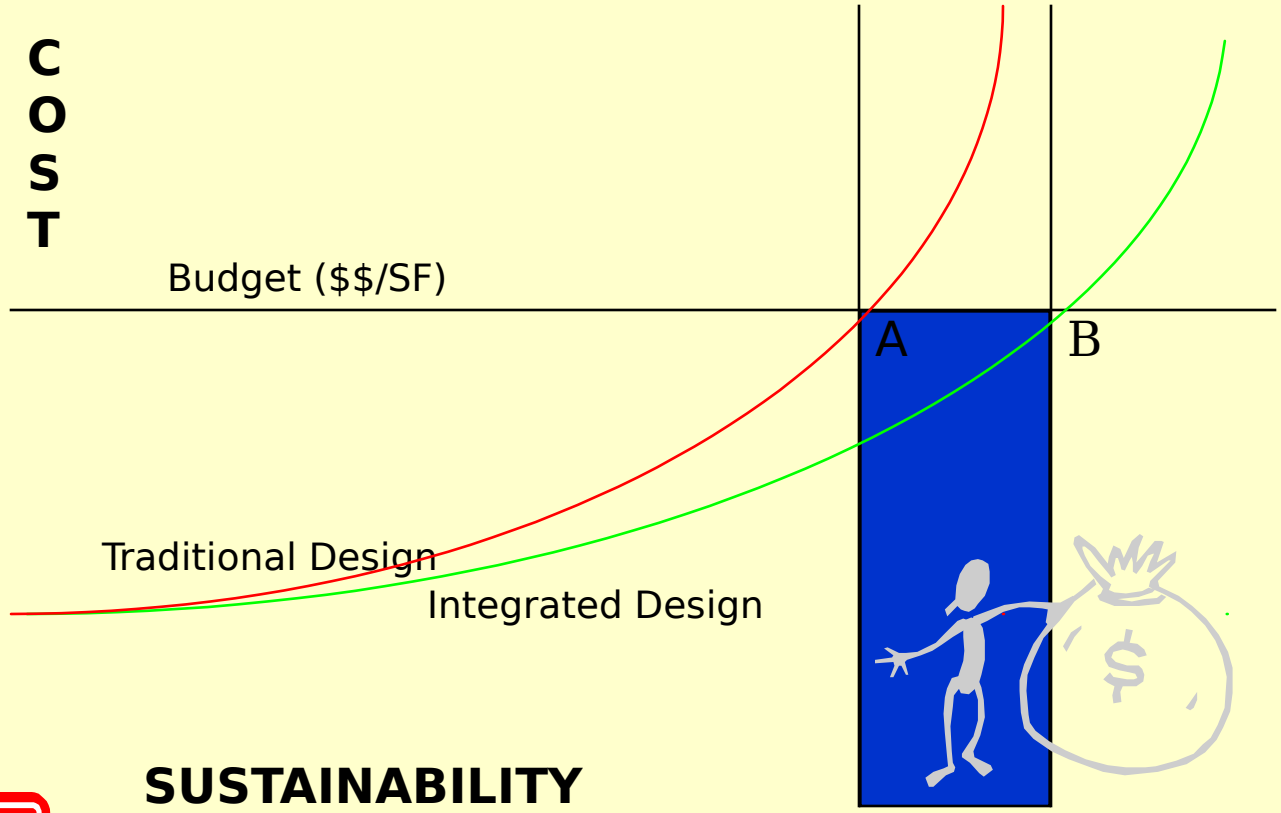
- Organizations use Criteria Manager to manage facility criteria & requirements
- Project teams hold charrettes using Criteria Composer to create 1391 (export to Parametric Cost Estimator and 1391 Planning Report)
- Project teams use Layout Composer to create 3D model for design analysis (create facility object model using industry modeling standard – IAI IFC, export to COTS/GOTS)
- Teams use Sustainable Designer's Aid to set SPiRiT goals, record decisions & rate project (export to DrChecks)
- Teams use DrChecks to review design

Building Composer Process



http://bc.cecer.army.mil/bc

Cost and Integrated Design

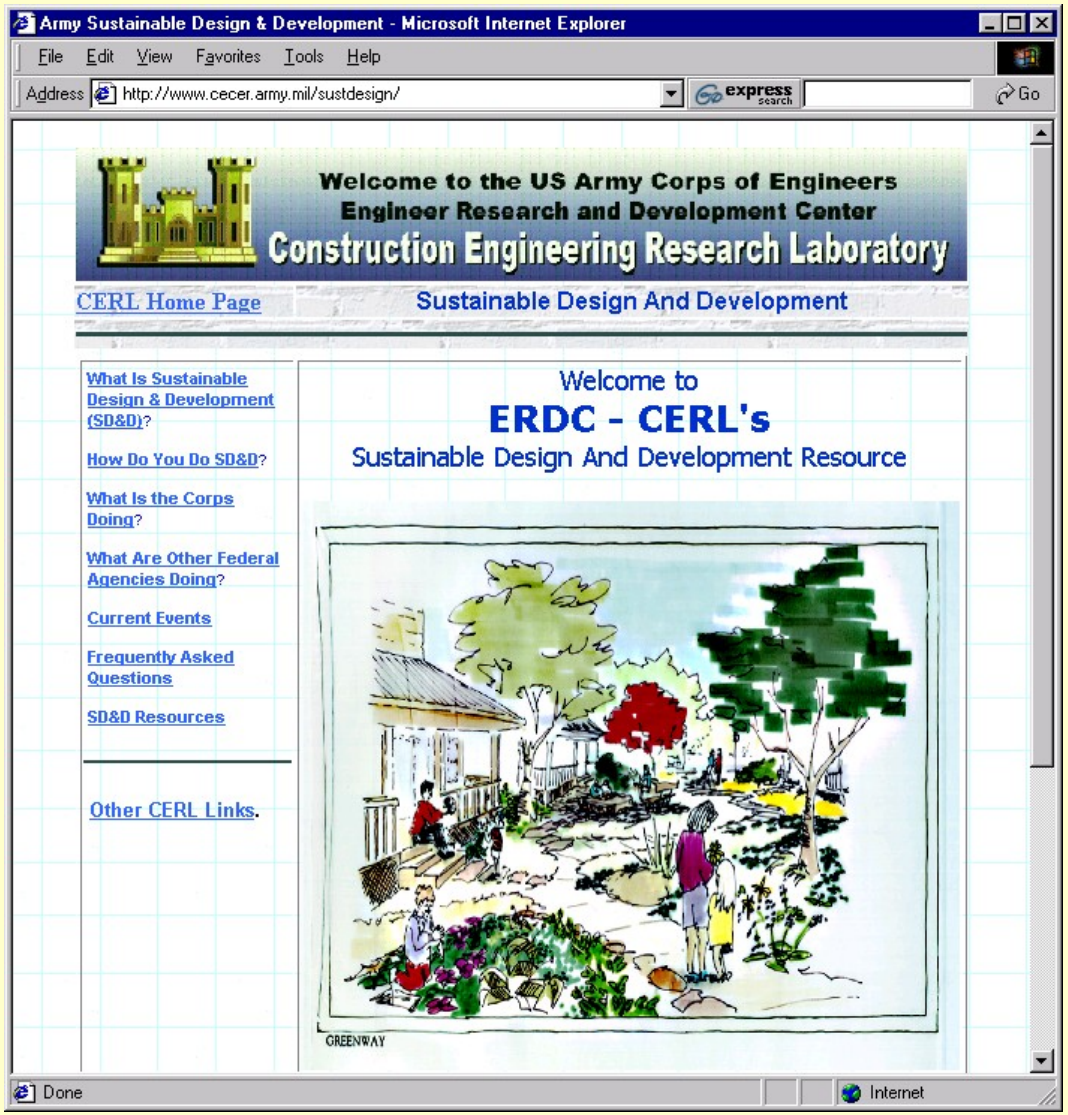


SUSTAINABILITY

Hints for Success:

- Sustainability is a life-cycle commitment - during Master Planning, 1391s, design, construction, O&M and demolition/reuse.
- SD&D is a collaborative multidisciplinary team effort.
- Planning and Design Charrettes focus team on sustainable goals so project can meet SPiRiT rating.
- Construction is just as important as design and practices must care for the environment and minimize construction waste.
- This is a process change, requires patience, flexibility and willingness to learn new patterns.

Where do I find the information I need?



http://www.cecer.army.mil/SustDesign

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SD&D Website Contents:

- What is Sustainable Design & Development (SD&D)?
- What Are Other Federal Agencies Doing?
- What is the Corps Doing? (SPiRiT)
- How Do You Do SD&D?
- Current Events
- Frequently Asked Questions
- SD&D Resources

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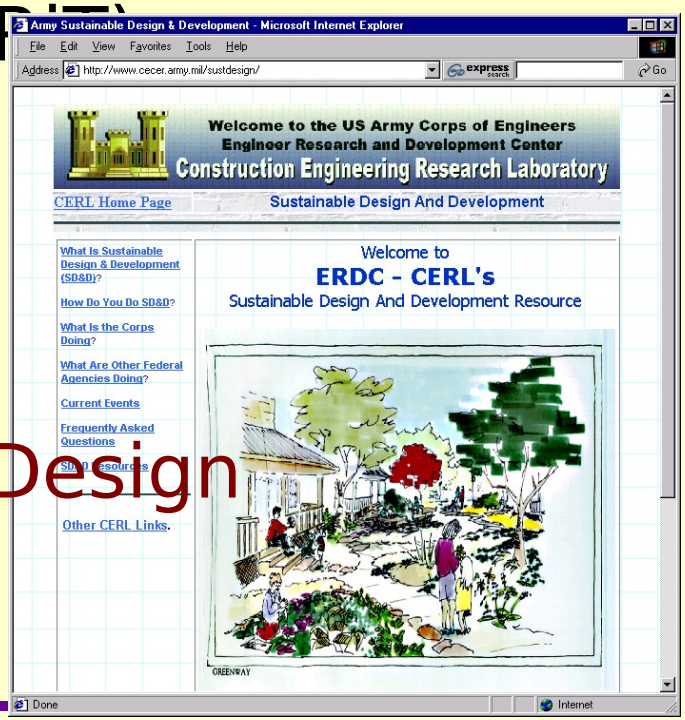
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Other CERL Links.
Welcome to
ERDC - CERL's
Sustainable Design And Development Resource
GREENWAY
Done
Internet

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Points of Contact

- Sustainable Design & Development:
  - Guidance for Sustainable Building Delivery - Richard L. Schneider, CEERD-CN-E, 217/398-5424, richard.l.schneider@ erdc.usace.army.mil
  - Sustainable Designer's Aid - Annette L. Stumpf, CEERD-CF-N, 217/373-7542, annette.l.stumpf@ erdc.usace.army.mil
  - SPiRiT: Call Annette or Rich